

PATENT SPECIFICATION

94497

307,542

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Complete Left : March 24, 1928.

Complete Accepted : March 11, 1929.



PROVISIONAL SPECIFICATION.

Improvements in and connected with Flexible Couplings such as used on Automobiles.

We, MORRIS COMMERCIAL CARS LIMITED, a Company duly incorporated under the laws of Great Britain, and PERCY GEORGE ROSE, and WILLIAM WILSON HAMILL, both Subjects of the King of Great Britain, all of Foundry Lane Works, Soho, Birmingham, do hereby declare the nature of this invention to be as follows:—

10 This invention comprises certain improvements in or relating to flexible couplings such as used on automobiles and for other purposes in which two shafts are connected through the medium of a flexible coupling member. The present invention is more particularly directed to the washers or washer like elements situated proximate to the bolt holes with which the flexible member is provided and the purpose of the said invention is to secure them against derangement during application, and generally to facilitate the process of securing the washers in position.

25 According to the present invention the washer or washer element is provided with a part adapted to partake of a peripheral character that is to say the part or extension occupies a plane substantially parallel to the axis of the flexible member whereby it takes a bearing on the periphery thereof.

35 In a convenient embodiment of our present invention, the washer elements may for convenience be pressed from sheet metal and may on their marginal edges be formed to a corrugated or rounded shape which corrugations are pressed into the surface of the disc when the washer is clamped in position. The outer radial

edges of the washer element may turn outward in relation to the face of the flexible disc so as to avoid a hinge point and allow of the transmission of the torque in a manner which will not unduly stress the material in the vicinity of the radial edges.

Preferably integral with the washer element is an extension which is turned over at right angles or substantially at right angles to the main plane of the washer element so as to constitute when in position a finger or abutment which prevents the washer element from displacement around the clamping bolt when the clamping nut is being tightened up. A further advantage of my present invention resides in the reduction of the possibility of incorrect reassembly of the washer elements, as it sometimes happens that in the process of reassembly the washers may be turned over in which case the form of the structure would be prejudicial to the material of the flexible disc. The extension is of convenient dimensions and may be arranged to have a lateral dimension approximating to two thirds of the width or thickness of the flexible disc and in a circumferential direction it may conveniently be of similar dimensions to the widest part of the washer element between its corrugations.

Dated the 9th day of December, 1927.
ROWLAND L. GOOLD,
Chartered Patent Agent,
Waterloo House, 20, Waterloo Street,
Birmingham,
Agent for the Applicants.

COMPLETE SPECIFICATION.

Improvements in and connected with Flexible Couplings such as used on Automobiles.

We, MORRIS COMMERCIAL CARS LIMITED, a Company incorporated under the laws of Great Britain, PERCY GEORGE ROSE, and WILLIAM WILSON HAMILL, both Subjects of the King of Great Britain, all of Foundry Lane Works, Soho, Birmingham, do hereby declare the nature of this invention to be as follows:—
[Price 1/-]

WILSON HAMILL, both Subjects of the King of Great Britain, all of Foundry Lane Works, Soho, Birmingham, do hereby declare the nature of this invention to be as follows:—

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tion and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

5 This invention relates to the type of flexible coupling incorporating a flexible element of textile, rubber or other similar material connected by torque-transmitting members on the one side with the driving shaft and on the other side with the driven shaft, the torque transmitting member being coupled to the flexible element at a plurality of points at each of which a separate clamping member is incorporated at the side of the flexible element. The present invention compre-
10 shaft and on the other side with the driven shaft, the torque transmitting member being coupled to the flexible element at a plurality of points at each of which a separate clamping member is incorporated at the side of the flexible element. The present invention compre-
15 hends a coupling of this type wherein the said separate clamping members are each furnished with an abutment portion adapted to engage with the periphery of the flexible element. In the following specification the invention will be described as applied to the flexible coupling described in our concurrent applica-
20 tion 28,833 of 1927 (Serial No. 306,980).

25 In order that this invention may be clearly understood and readily carried into practice, reference may be had to the appended explanatory drawings on which:—

30 Figure 1 is a part sectional elevation of a flexible coupling according to our said concurrent application and incorporating the present invention.

35 Figure 2 is an elevation at right-angles to figure 1 of a torque transmitting member forming part of figure 1.

Figure 3 is a sectional elevation at right-angles to figure 2, the section plane being on line XX of figure 2.

40 Figure 4 is a sectional plan on line YY of figure 2.

Figure 5 is a plan view of a complementary clamping element in accordance with the present invention.

45 Figure 6 includes a side and end elevation of the complementary clamping element shown in figure 5.

Figures 7, 8, 11 and 12 illustrate various forms of spider extremities or complementary clamping washers according to the present invention.

50 Figures 9, 10 and 13 are transverse sectional views illustrating various arrangements of spider extremities and complementary clamping washers in mutual relation and in relation to the flexible element.

60 In the coupling illustrated the centralizing member *a* or "spider" comprises advantageously a pressing or stamping with radially directed arms *b* usually, but not necessarily, three in number, to which is conveniently welded a hollow central boss *c* closed at the outer side and at the

other extending axially inwards to constitute the female component of the centreing device, while the other spider *d* is provided with a ball *e* fixed by any convenient expedient such as a washer *f* and rivetted shank *g* and adapted to fit into the interior of the said boss *c*. The hollow central boss can, if desired, be packed with grease or other lubricant to form a grease-cup and thereby to reduce noise and wear.

70 The extremities *h* of the radially directed arms *b*, *b'* are perforated at *i* to receive the driving bolts *j* and have one, two or more radial or sinuous corrugations or depressions *k* (shown in section figure 4) viewed from the exterior of the coupling. The said depressions form projections or salients relative to the adjacent face of the flexible disc *l* and are adapted to be drawn into the material when the coupling bolts *j* are tightened in a clamping process; the said projections, however, are of a rounded character and are on the outer edges flared away from the disc as shown at *m* figure 4, so as to avoid a sharp edge, which might otherwise constitute a hinge point to the detriment of the coupling when the material flexes during working.

75 The clamping extremities of the spider are integral therewith as before mentioned which spider is conveniently pressed up from a sheet of metal of suitable gauge. The outermost marginal edges of the spider are preferably turned away from the flexible member as indicated at *h* in figure 1. The complementary washers *n* figures 5, 6 and 7 which assist in transmitting the torque are with advantage of similar shape to the clamping extremities of the spider, that is to say, with rounded radial or sinuous depressions *k'* lying below the general plane of the washer relative to the adjacent face of the flexible disc and with the said projections flared or turned away from the adjacent face of the disc, as shown at *m'* to constitute corrugations in like manner to the spider extremities *n*.

80 The complementary clamping washer *n* may for convenience be pressed from sheet metal and integral therewith is an extension *o* which is turned over at right angles or substantially at right angles to the main plane of the washer element so as to constitute when in position a finger or abutment which prevents the washer element from displacement around the clamping bolt when the clamping nut is being tightened up. A further advantage of our present invention resides in the reduction of the possibility of incorrect reassembly of the washer elements, as it sometimes happens that in the process of
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reassembly the washers may be turned over in which case the form of the structure would be prejudicial to the material of the flexible disc. The extension is of convenient dimensions and may be arranged to have a lateral dimension approximating to two thirds of the width or thickness of the flexible disc and in a circumferential direction it may conveniently be of similar dimensions to the widest part of the washer element between its corrugations k^1 .

In like manner to the spider extremities, the complementary clamping washer n may have its marginal edges in addition to those indicated at m^1 turned away or curved outwardly from the flexible member as indicated at n^1 .

In order to take up potential slackness due to ageing of the flexible disc or to other conditions set up during working, a follow-up means may be associated with the coupling bolts and the corrugated washers, consisting conveniently of a spring washer having two or more convolutions interposed between the head of the coupling bolt j and the proximate face of the serrated washer.

The bolt holes in the flexible disc may with advantage be made initially slightly smaller in diameter than the coupling bolts whereby when the latter are tightened the material in the vicinity of the bolt is caused to close thereonto. The resilient means aforementioned ensure continuity of the compressive action of the bolt, even when the coupling has been in use a considerable time, which arrangements prevent the bolts from becoming loose in their holes. It will be apparent that couplings as herein described present facilities for quick assembly or disassembly, while the comparatively long corrugations in the spider and complementary washers more satisfactorily transmit the drive to and from the flexible material.

While we have illustrated salients or projections arranged more or less radially in relation to the axis of the flexible element, other alternative arrangements may be incorporated in addition to or in substitution for the disposition shown; for example—the salients may be of wave-like shape extending in a radial direction or in a circumferential direction, or intermediate directions, or may have an arcuate configuration or triangular shape or arrow head shape, with the apex arranged radially or circumferentially. Some arrangements are illustrated in figures 7, 8, 11 and 12. In Figure 7 is illustrated in dotted lines at o^1 serrations or millings provided to increase the grip of the spider extremity or clamping

washer on the adjacent face of the flexible member. Figure 8 illustrates transverse projections p^1 disposed above and below the bolt hole l , which projections p^2 may be employed in addition to the radial projections q^1 . The dotted lines r^1 indicate another arrangement of serrations which, as in the case with those shown in figure 7, may be used in addition to or in substitution for any of the other forms of salient or projection hereinbefore described. In figure 11 is shown a spider extremity or clamping washer having an arrow head shape s^1 disposed above the bolt hole i with its apex t^1 directed radially outwardly. Figure 12 shows a still further shape of projection or salient comprising a circular or annular boss u^1 concentric with the bolt hole i .

The engagement of the projections or salients may be arranged to provide wedging or gripping action when the bolt is tightened, and in Figure 9 the projections or salients in one of the gripping members v^1 are arranged vis-a-vis to those on the opposed member whereby when the two clamping members are drawn towards each other by the bolt, the material is compressed around the bolt. In another disposition shown in figure 10, one of the clamping members is furnished with a central radial projection x^1 , while the opposed member on the other face of the flexible member has two radial projections v^1 similar in location to those shown in Figure 9. In figure 13 one only of the clamping members is furnished with projections v^1 while the other has no inward projections but, owing to the shape of the projections, v^1 the wedging or compressive action is preserved.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed we wish it to be understood that we do not in this application claim the invention claimed in our earlier application 28,833 of October 29th 1927 (Serial No. 306,980) subject to this we declare that what we claim is:—

1. A flexible coupling of the type referred to wherein the said separate clamping members are each furnished with an abutment portion adapted to engage with the periphery of the flexible element.

2. A clamping member substantially as herein set forth.

Dated this 3rd day of December, 1928.

ROWLAND L. GOOLD,
Chartered Patent Agent,
Waterloo House, 20, Waterloo Street,
Birmingham.

[This Drawing is a reproduction of the Original on a reduced scale.]

Fig. 7.

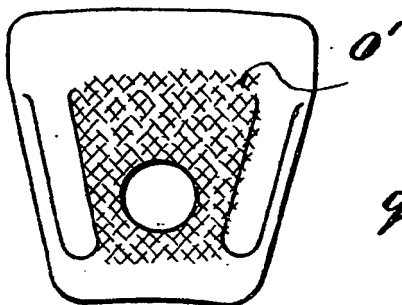


Fig. 8.

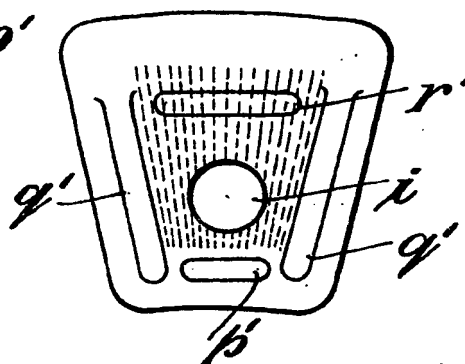


Fig. 9.

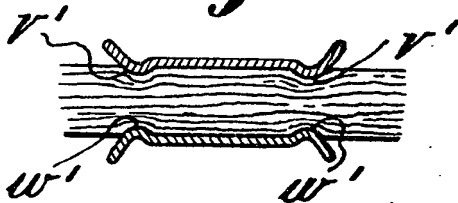


Fig. 10.

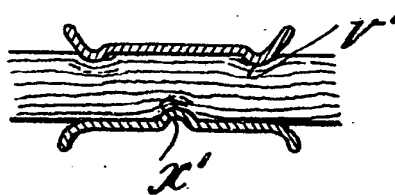


Fig. 11.

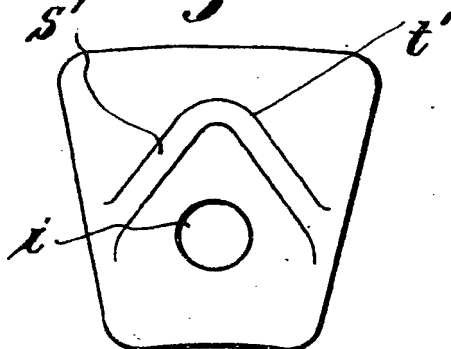


Fig. 12.

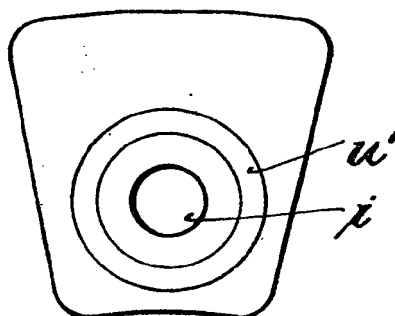
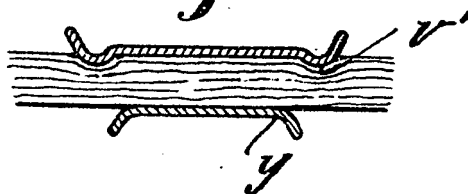


Fig. 13.



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[This Drawing is a reproduction of the Original on a reduced scale.]

Fig. 1.

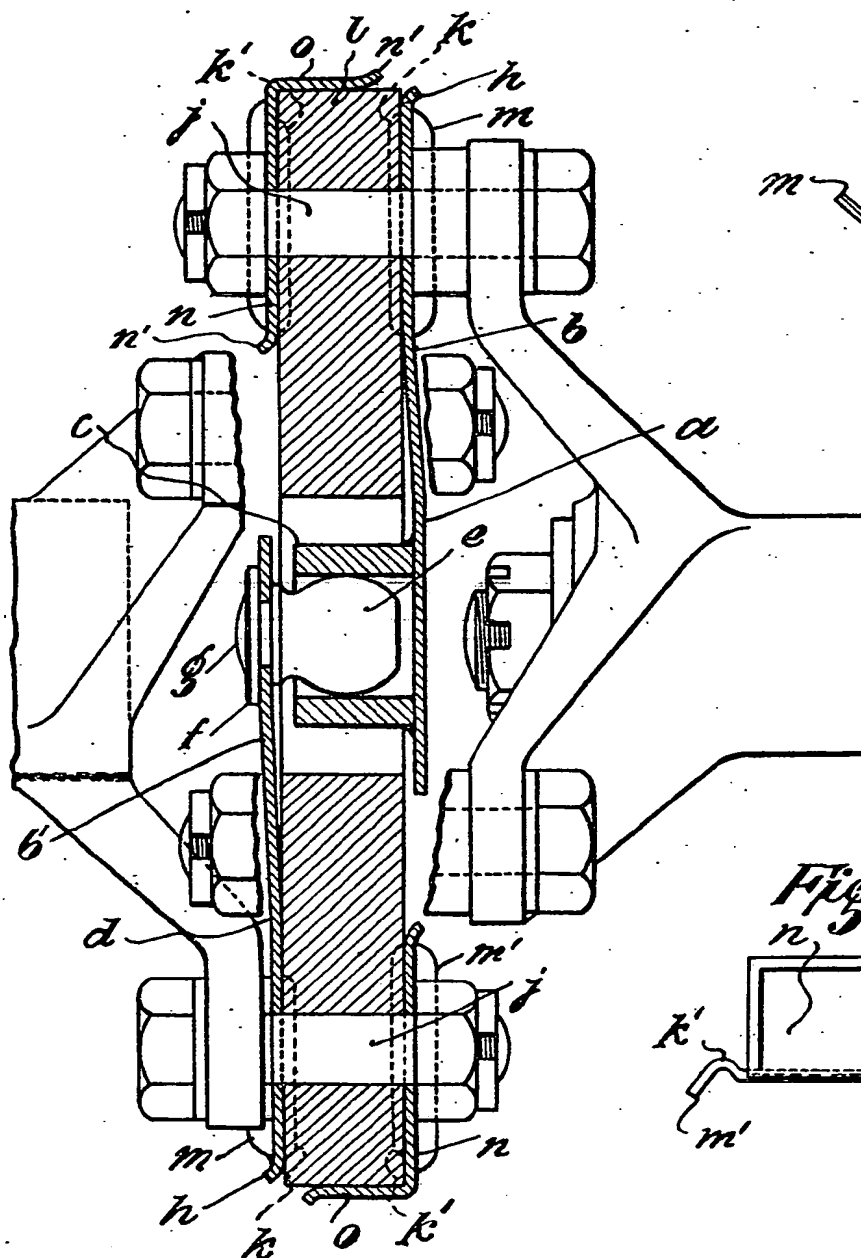


Fig. 4.

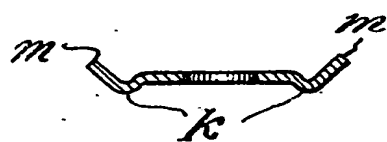


Fig. 6.

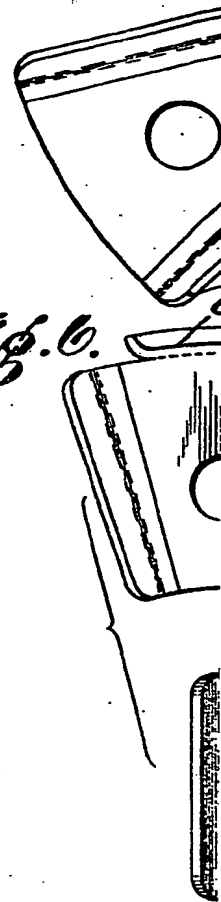
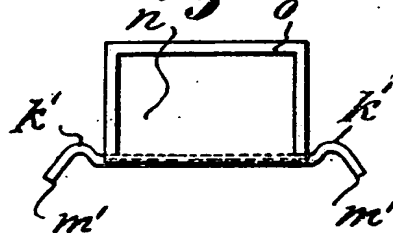


Fig. 5.



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Fig. 2

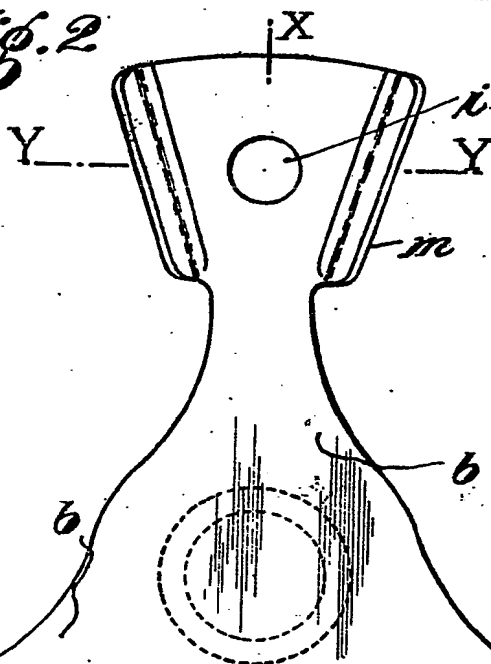


Fig. 4.



Fig. 3.

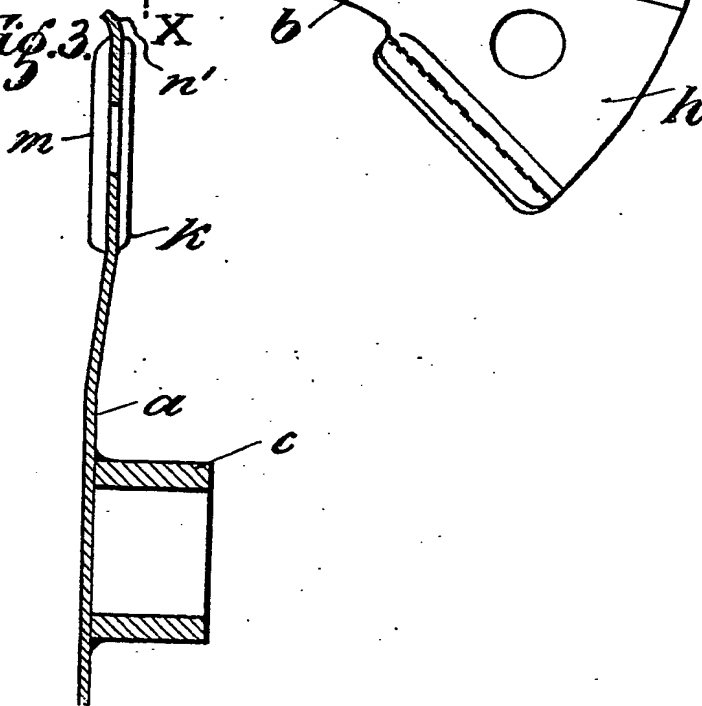
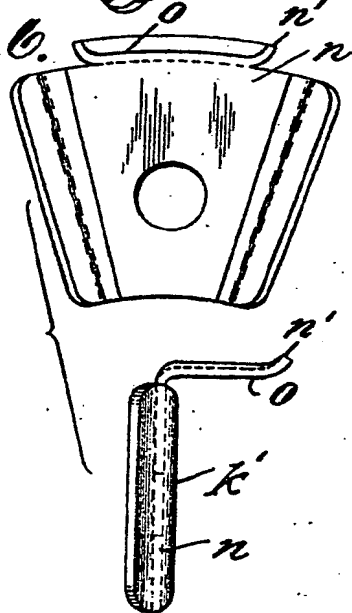
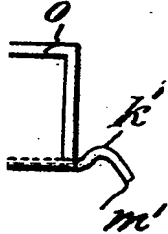


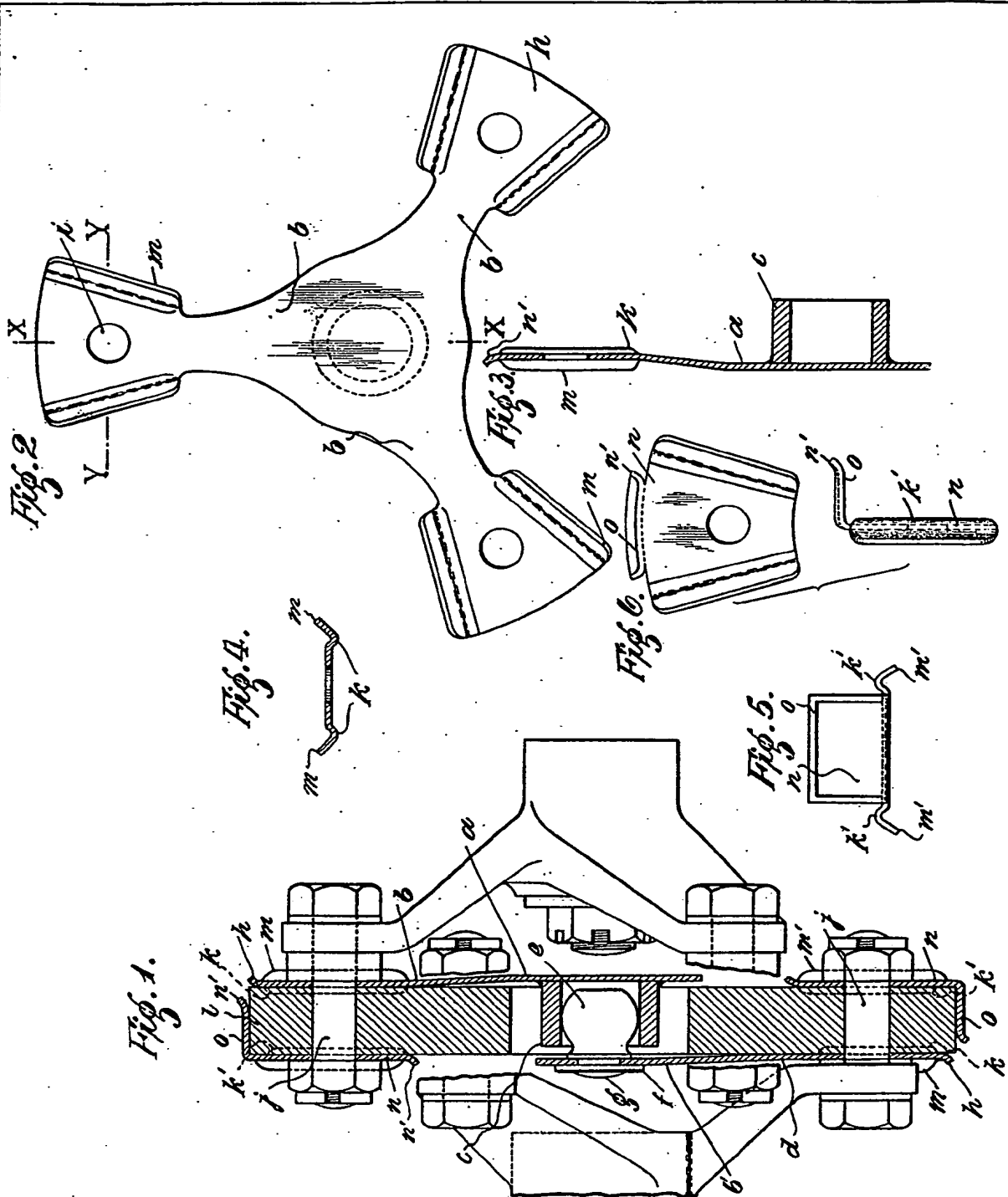
Fig. 6.



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